GROUP 54B

LOCAL INTERCONNECT NETWORK (LIN)

CONTENTS

GENERAL INFORMATION 54B-2

SPECIAL TOOLS. 54B-3

TROUBLESHOOTING 54B-4

DIAGNOSIS FUNCTION 54B-4

DIAGNOSIS CODE CHART 54B-5

DIAGNOSTIC TROUBLE CODE PROCEDURES 54B-6

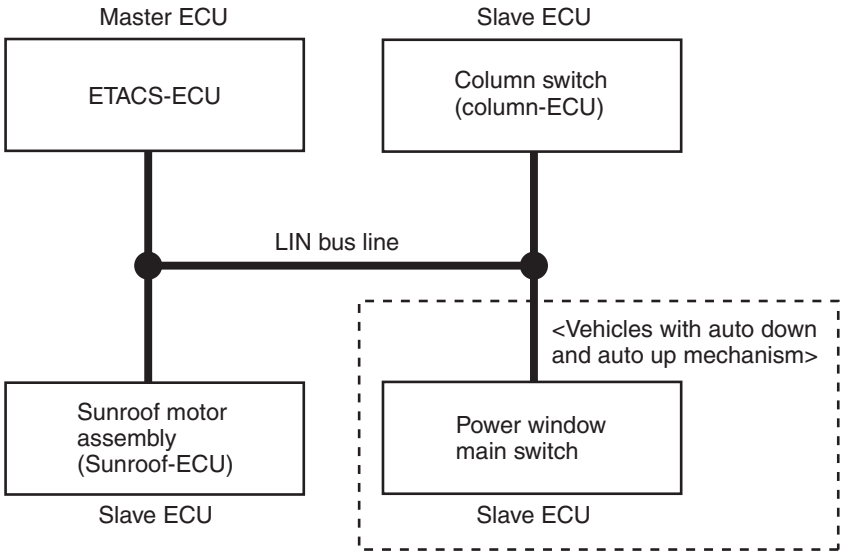
GENERAL INFORMATION

M1545110000093

LIN refers to "Local Interconnect Network," which is a serial multiplex communication protocol* administrated by LIN consortium. A communication circuit employing the LIN protocol connects each ECU, and switch and sensor data can be shared among ECUs, which enables more reduction in wiring.

*NOTE: *: The regulations that have been decided in detail, from software matters such as the necessary transmission rate for communication, the system, data format, and communication timing control method to hardware matters such as the harness type and length and the resistance values.*

STRUCTURE



AC608956AB

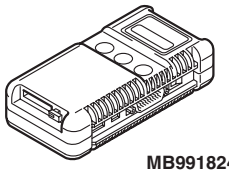
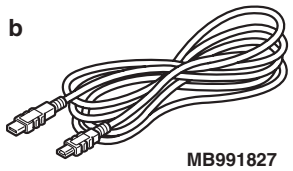
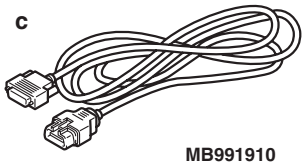
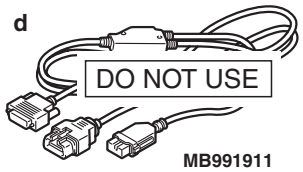
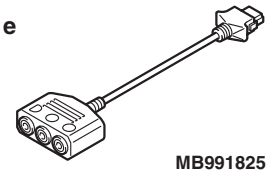
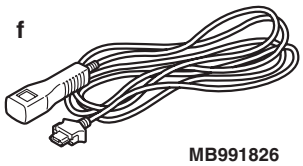
Master and slave ECUs are connected to the LIN bus lines. The master ECU is the ETACS*1-ECU, and the slave ECUs are the column switch (column-ECU), the sunroof-ECU and the power window main switch*2. The master ECU requests these slave ECUs to communicate each other via communication lines.

*NOTE: *1: ETACS (Electronic Time and Alarm Control System)*

*NOTE: *2: Vehicles with auto down and auto up mechanism.*

SPECIAL TOOLS

M1545100100129

Tool	Number	Name	Use
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991825 f  MB991826 MB991955	MB991955 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991825 f. MB991826	M.U.T.-III sub-assembly a. Vehicle Communication Interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III measure adapter f. M.U.T.-III trigger harness	⚠ CAUTION **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** LIN communication line check (service data and diagnosis codes)

TROUBLESHOOTING

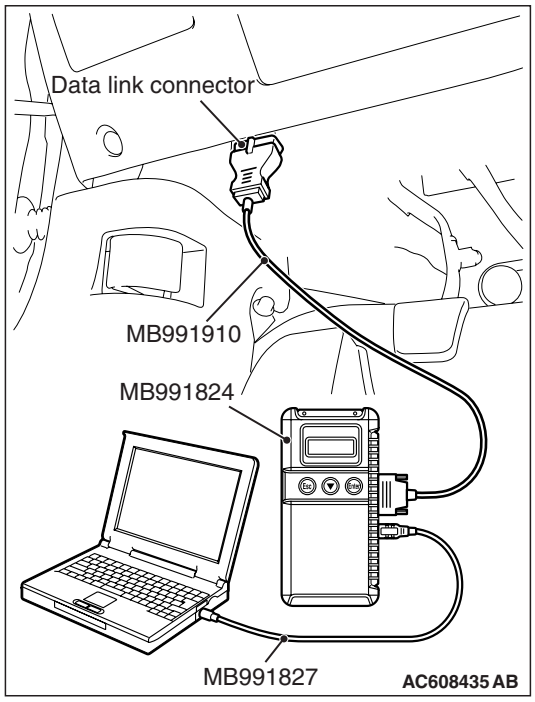
DIAGNOSIS FUNCTION

M1545104200043

HOW TO CONNECT THE SCAN TOOL (M.U.T.-III)

Required Special Tools:

MB991958: Scan Tool (M.U.T.-III Sub Assembly)
- MB991824: Vehicle Communication Interface (V.C.I.)
- MB991827: M.U.T.-III USB Cable
- MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect special tool MB991827 to special tool MB991824 and the personal computer.
4. Connect special tool MB991910 to special tool MB991824.
5. Connect special tool MB991910 to the data link connector.
6. Turn the power switch of special tool MB991824 to the "ON" position.

   NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the M.U.T.-III system on the personal computer.

NOTE: Disconnecting scan tool MB991958 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.

HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

Required Special Tools:

MB991958: Scan Tool (M.U.T.-III Sub Assembly)
- MB991824: Vehicle Communication Interface (V.C.I.)
- MB991827: M.U.T.-III USB Cable
- MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

NOTE: If the battery voltage is low, diagnostic trouble codes will not be set. Check the battery if scan tool MB991958 does not display.

1. Connect scan tool MB991958 to the data link connector.

2. Turn the ignition switch to the "ON" position.
3. Select "System select" from the start-up screen.
4. Select "From 2006 MY" of "Model Year." When the "Vehicle Information" is displayed, check the contents.
5. Select "ETACS" from "System List", and press the "OK" button.

   NOTE: When the "Loading Option Setup" list is displayed, check the applicable item.
6. Select "Diagnostic Trouble Code."
7. If a DTC is set, it is shown.
8. Choose "Erase DTCs" to erase the DTC.

DIAGNOSIS CODE CHART

M1545100200104

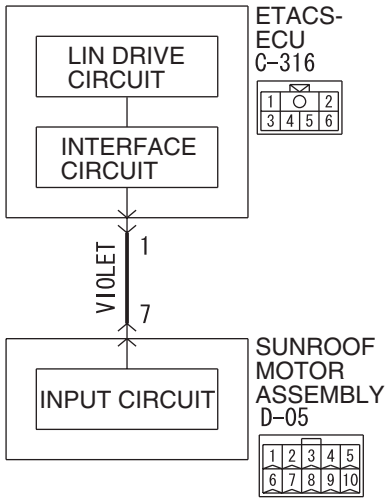
Diagnosis code No.	Diagnostic item	Reference page
U0169	Sunroof LIN timeout	P.54B-6
U0215	PW SW (DR) LIN timeout <Vehicles with auto down and auto up mechanism>	P.54B-9
U1109	Column SW LIN timeout	P.54B-12
U150B	Column SW LIN checksum error	P.54B-15
U150C	PW SW (DR) LIN checksum error <Vehicles with auto down and auto up mechanism>	P.54B-16
U1511	Sunroof LIN checksum error	P.54B-17
U1514	Bit error (LIN)	P.54B-18
U1515	No-Bus activity error (LIN)	P.54B-19

DIAGNOSTIC TROUBLE CODE PROCEDURES

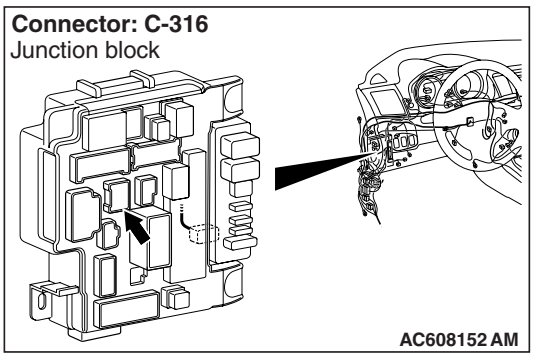
DTC U0169: Sunroof LIN timeout

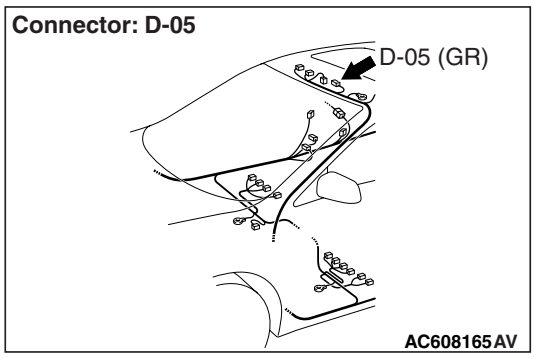
⚠ CAUTION
Before replacing the ECU, ensure that the communication circuit is normal.

Sunroof Motor Assembly LIN Communication Circuit



W8G54M045A





TROUBLE JUDGEMENT

The ETACS-ECU receives signal from the sunroof motor assembly (sunroof-ECU). If signal cannot be received at all, DTC U0169 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the LIN bus lines between the sunroof motor assembly and the ETACS-ECU, the power supply system of the sunroof motor assembly, or the sunroof motor assembly itself may be defective.

Past trouble

- If DTC U0169 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the LIN bus line between the power window main switch and the ETACS-ECU, and the power supply system of the power window main switch.

TROUBLESHOOTING HINTS

- The sunroof motor assembly may be defective.
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

TSB Revision

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check ETACS-ECU connector C-316 and sunroof motor assembly connector D-05 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

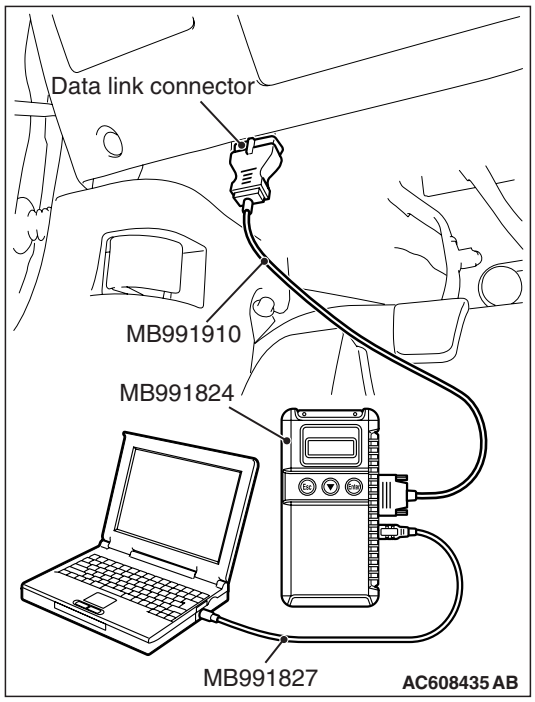
Q: Are ETACS-ECU connector C-316 and sunroof motor assembly connector D-05 in good condition?

YES : Go to Step 2.
NO : Repair or replace the damaged component(s).

STEP 2. Check the wiring harness between ETACS-ECU connector C-316 (terminal 1) and sunroof motor assembly connector D-05 (terminal 7).

Q: Is the wiring harness between ETACS-ECU connector C-316 (terminal 1) and sunroof motor assembly connector D-05 (terminal 7) in good condition?

YES : Go to Step 3.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.



STEP 3. Recheck for diagnostic trouble code.
Check again if the DTC is set to the ETACS-ECU.

⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Erase the DTC.
(7) Turn the ignition switch to the "ON" position.
(8) Check if the DTC is set.
(9) Turn the ignition switch to the "LOCK" (OFF) position.

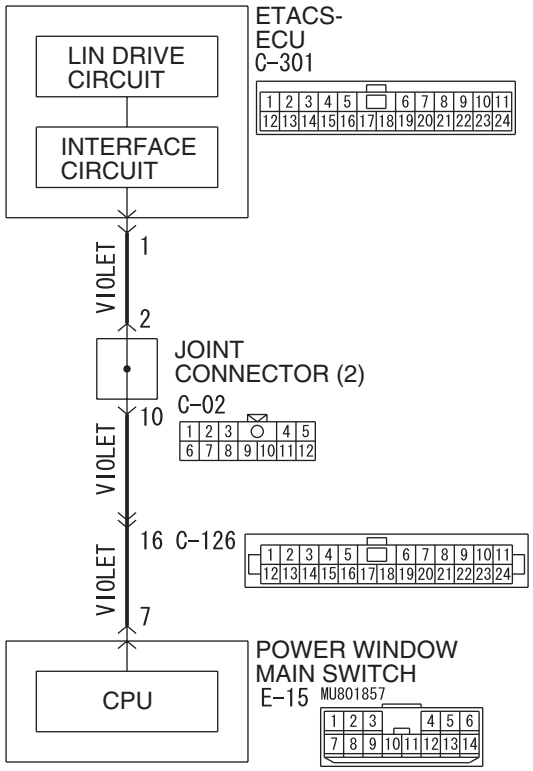
Q: Is the DTC set?

YES : Replace the sunroof motor assembly.
NO : A poor connection, open circuit or other intermittent malfunction is present in the LIN bus lines between the sunroof motor assembly and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-13).

DTC U0215: PW SW (DR) LIN timeout <Vehicles with auto down and auto up mechanism>

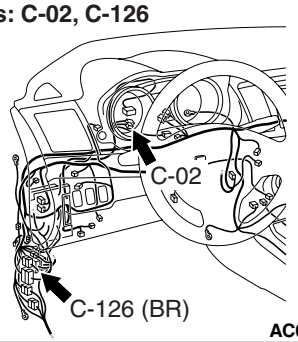
⚠ CAUTION
Before replacing the ECU, ensure that the communication circuit is normal.

Power Window Main Switch LIN Communication Circuit



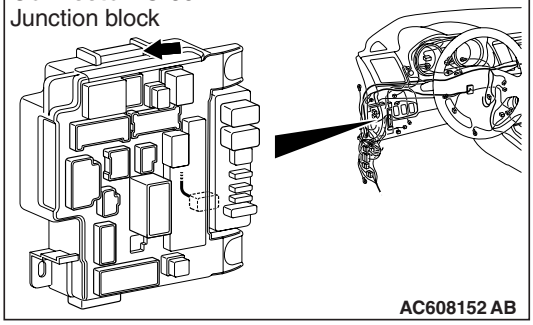
W8G54M046A

Connectors: C-02, C-126



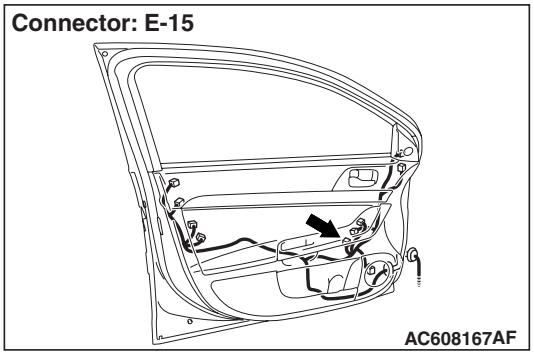
AC608145BM

Connector: C-301
Junction block



AC608152 AB

TSB Revision



TROUBLE JUDGEMENT

The ETACS-ECU receives signal from the power window main switch. If signal cannot be received at all, DTC U0215 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the LIN bus lines between the power window main switch and the ETACS-ECU, the power supply system of the power window main switch, or the power window main switch itself may be defective.

Past trouble

- If DTC U0215 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the LIN bus line between the power window main switch and the ETACS-ECU, and the power supply system of the power window main switch.

TROUBLESHOOTING HINTS

- The power window main switch may be defective.
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check ETACS-ECU connector C-301 and power window main switch connector E-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ETACS-ECU connector C-301 and power window main switch connector E-15 in good condition?

YES : Go to Step 2.
NO : Repair or replace the damaged component(s).

STEP 2. Check the wiring harness between ETACS-ECU connector C-301 (terminal 1) and power window main switch connector E-15 (terminal 7).

NOTE: Also check joint connector C-02 and intermediate connector C-126 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-02 or intermediate connector C-126 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between ETACS-ECU connector C-301 (terminal 1) and power window main switch connector E-15 (terminal 7) in good condition?

YES : Go to Step 3.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

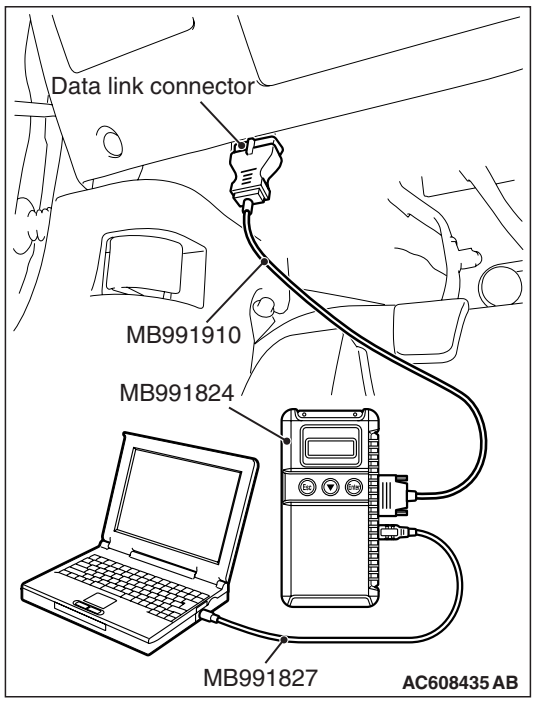
STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the ETACS-ECU.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Erase the DTC.
(7) Turn the ignition switch to the "ON" position.
(8) Check if the DTC is set.
(9) Turn the ignition switch to the "LOCK" (OFF) position.



Q: Is the DTC set?

YES : Replace the power window main switch.

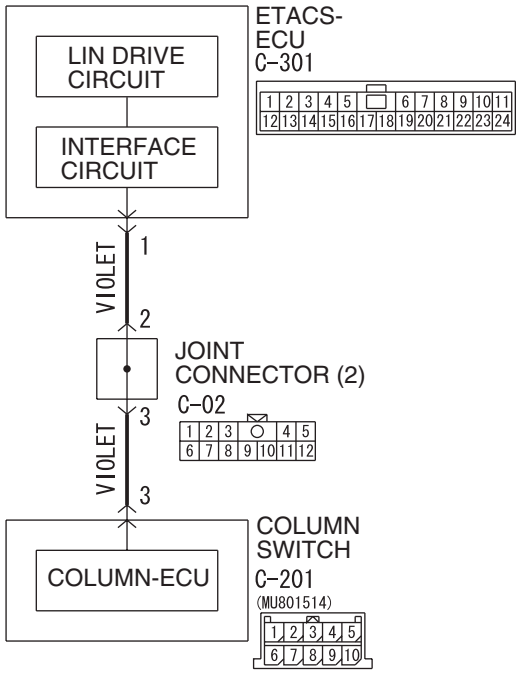
NO : A poor connection, open circuit or other intermittent malfunction is present in the LIN bus lines between the power window main switch and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-13).

DTC U1109: Column SW LIN timeout

⚠ CAUTION

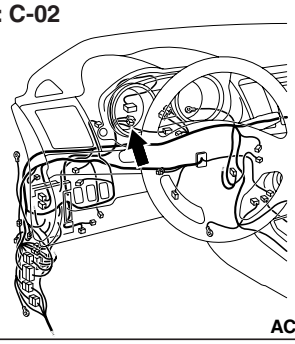
Before replacing the ECU, ensure that the communication circuit is normal.

Column Switch LIN Communication Circuit



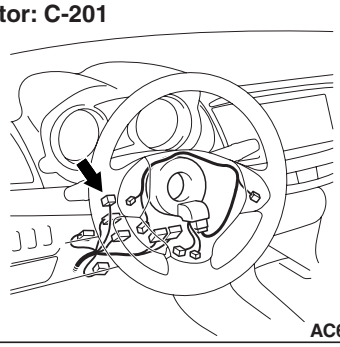
W8G54M044A

Connector: C-02



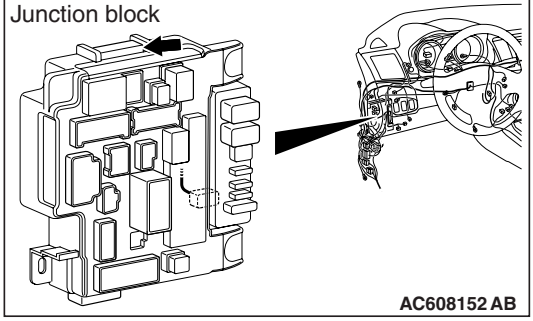
AC608145BK

Connector: C-201



AC608147AG

Connector: C-301
Junction block



AC608152AB

TSB Revision

TROUBLE JUDGEMENT

The ETACS-ECU receives signal from the column switch. If signal cannot be received at all, DTC U1109 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the LIN bus lines between the column switch and the ETACS-ECU, the power supply system of the column switch, or the column switch itself may be defective.

Past trouble

- If DTC U1109 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the LIN bus line between the power window main switch and the ETACS-ECU, and the power supply system of the power window main switch.

TROUBLESHOOTING HINTS

- The column switch may be defective.
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check ETACS-ECU connector C-301 and column switch connector C-201 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ETACS-ECU connector C-301 and column switch connector C-201 in good condition?

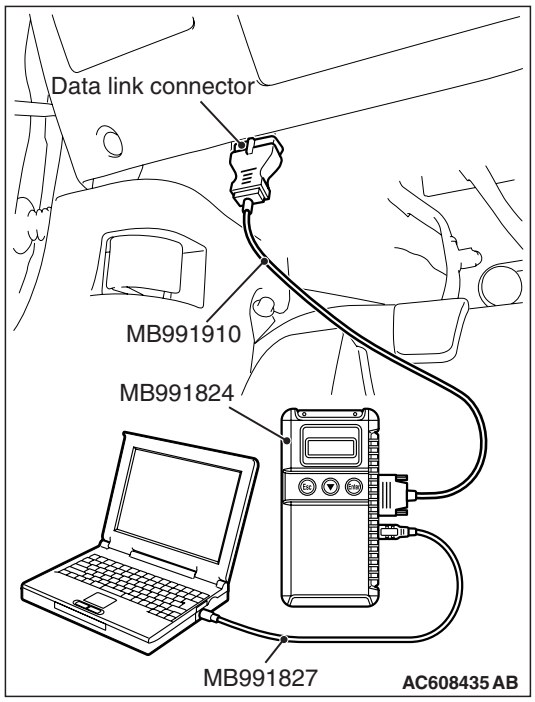
YES : Go to Step 2.
NO : Repair or replace the damaged component(s).

STEP 2. Check the wiring harness between ETACS-ECU connector C-301 (terminal 1) and column switch connector C-201 (terminal 3).

NOTE: Also check joint connector C-02 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-02 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between ETACS-ECU connector C-301 (terminal 1) and column switch connector C-201 (terminal 3) in good condition?

YES : Go to Step 3.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.



STEP 3. Recheck for diagnostic trouble code.
Check again if the DTC is set to the ETACS-ECU.

⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Erase the DTC.
(7) Turn the ignition switch to the "ON" position.
(8) Check if the DTC is set.
(9) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the column switch.
NO : A poor connection, open circuit or other intermittent malfunction is present in the LIN bus lines between the column switch and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-13).

DTC U150B: Column SW LIN checksum error

TROUBLE JUDGEMENT

The ETACS-ECU will set DTC U150B when abnormal signals are received from the column switch (column-ECU).

TROUBLESHOOTING HINTS

- The column switch (lighting switch) may be defective.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

Recheck for diagnostic trouble code.

Check again if the DTC is set to the ETACS-ECU.

⚠ CAUTION

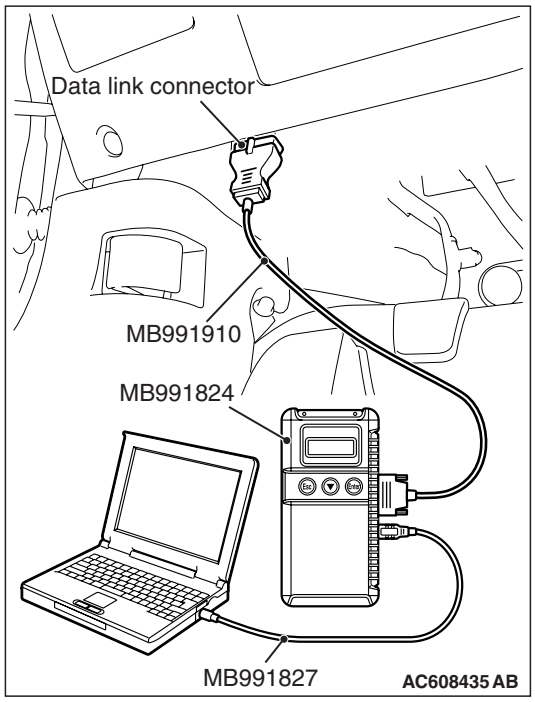
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Erase the DTC.
(7) Turn the ignition switch to the "ON" position.
(8) Check if the DTC is set.
(9) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the lighting switch.

NO : A poor connection, open circuit, or other intermittent malfunctions in the LIN bus lines between the column switch and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-13).



DTC U150C: PW SW (DR) LIN checksum error <Vehicles with auto down and auto up mechanism>

TROUBLE JUDGEMENT

The ETACS-ECU will set DTC U150C when abnormal signals are received from the power window main switch.

TROUBLESHOOTING HINTS

- The power window main switch may be defective.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

Recheck for diagnostic trouble code.

Check again if the DTC is set to the ETACS-ECU.

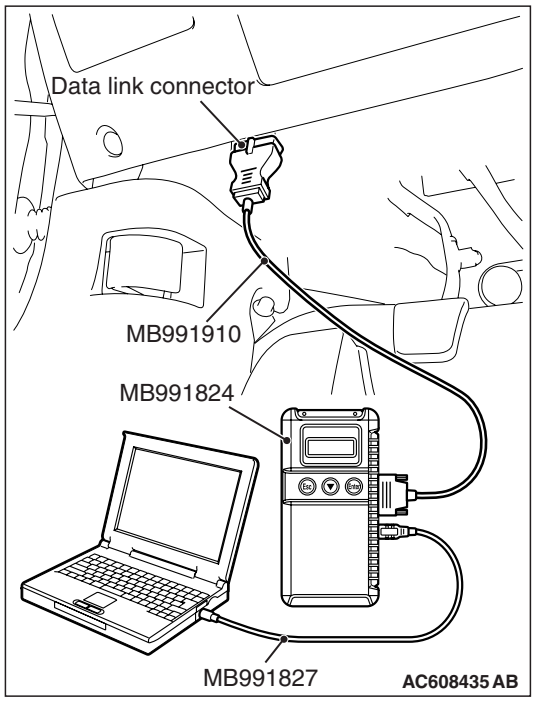
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Erase the DTC.
(7) Turn the ignition switch to the "ON" position.
(8) Check if the DTC is set.
(9) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the power window main switch.
NO : A poor connection, open circuit, or other intermittent malfunctions in the LIN bus lines between the power window main switch and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-13).



DTC U1511: Sunroof LIN checksum error

TROUBLE JUDGEMENT

The ETACS-ECU will set DTC U1511 when abnormal signals are received from the sunroof motor assembly (sunroof-ECU).

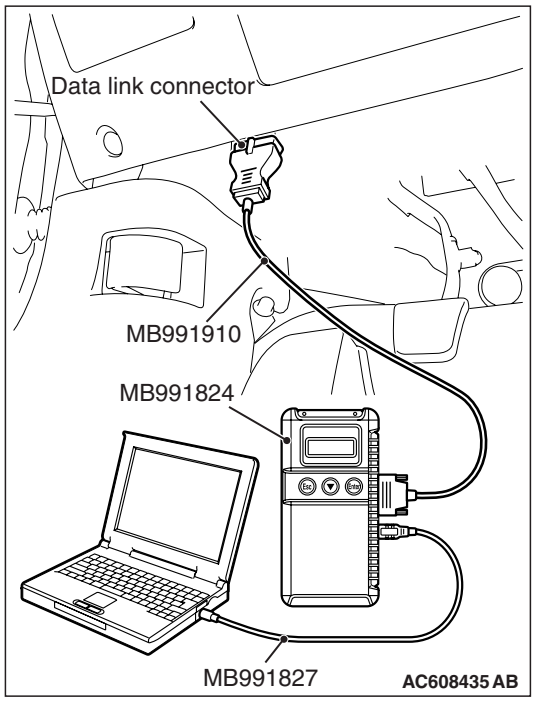
TROUBLESHOOTING HINTS

- The sunroof motor assembly may be defective.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



Recheck for diagnostic trouble code.

Check again if the DTC is set to the ETACS-ECU.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Erase the DTC.
(7) Turn the ignition switch to the "ON" position.
(8) Check if the DTC is set.
(9) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the sunroof motor assembly.
NO : A poor connection, open circuit, or other intermittent malfunctions in the LIN bus lines between the sunroof motor assembly and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-13).

DTC U1514: Bit error (LIN)

TROUBLE JUDGEMENT

The ETACS-ECU receives and sends data simultaneously. If the data contains a fault, the ETACS-ECU will set DTC U1514.

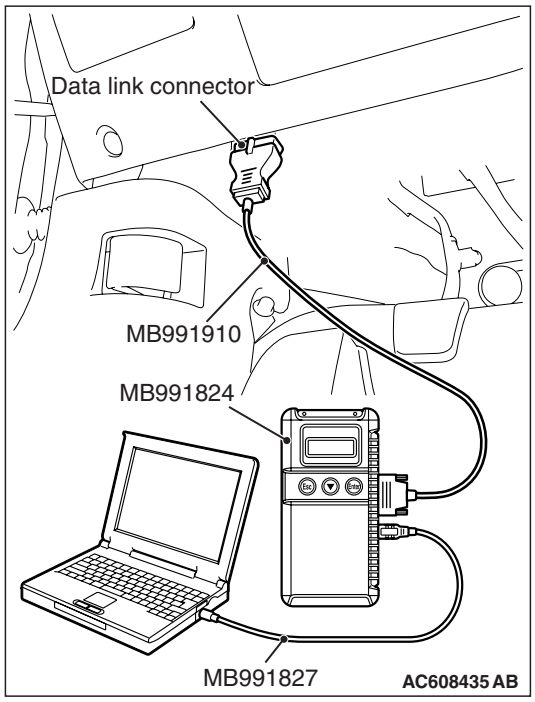
TROUBLESHOOTING HINTS

- The slave ECU may be defective.
- The ETACS-ECU may be defective.
- Electrical noise generated in the LIN bus lines

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



Recheck for diagnostic trouble code.

Check again if the DTC is set to the ETACS-ECU.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

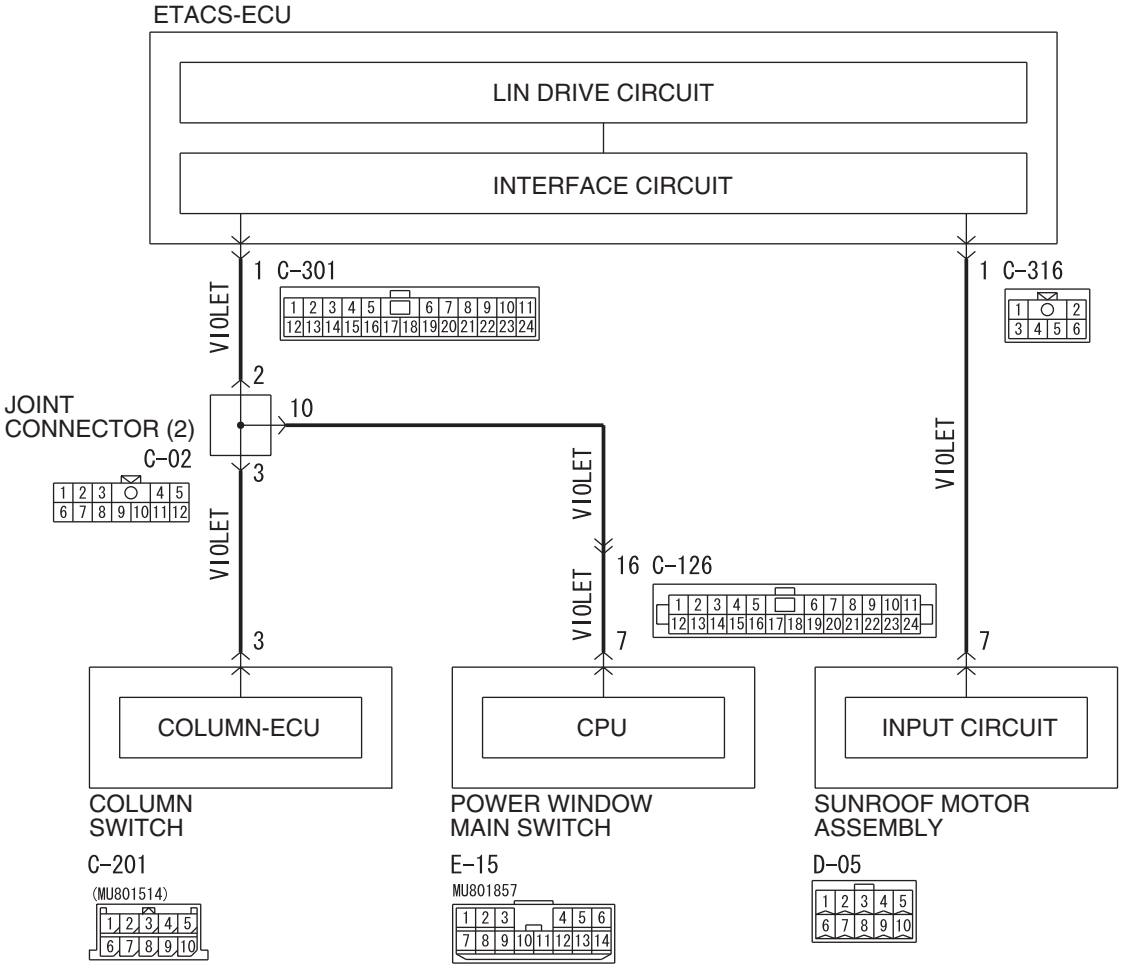
(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Erase the DTC.
(7) Turn the ignition switch to the "ON" position.
(8) Check if the DTC is set.
(9) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES <A DTC other than U1514 is set.> : Replace the appropriate ECU.
YES <The DTC U1514 is set.> : Replace the ETACS-ECU.
NO <The DTC is not set.> : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-13).

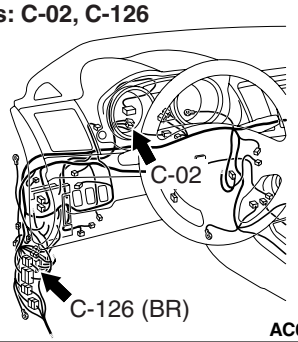
DTC U1515: No-Bus activity error (LIN)

LIN Communication Circuit



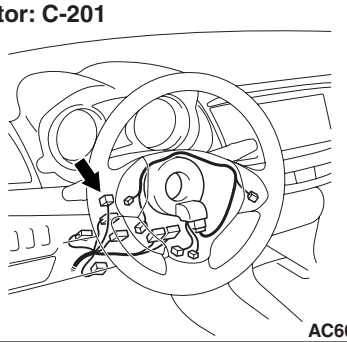
W8G54M047A

Connectors: C-02, C-126



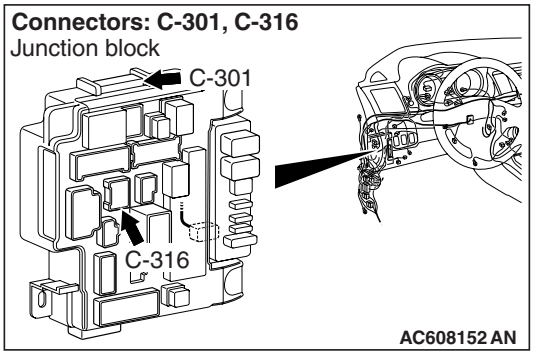
AC608145BM

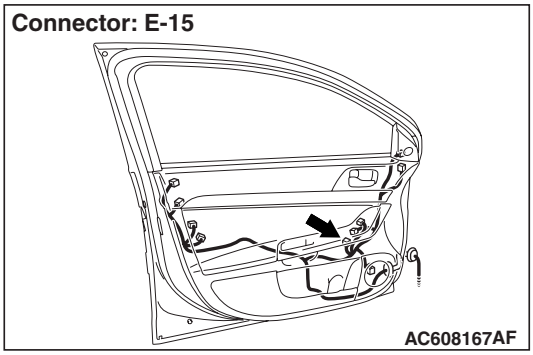
Connector: C-201

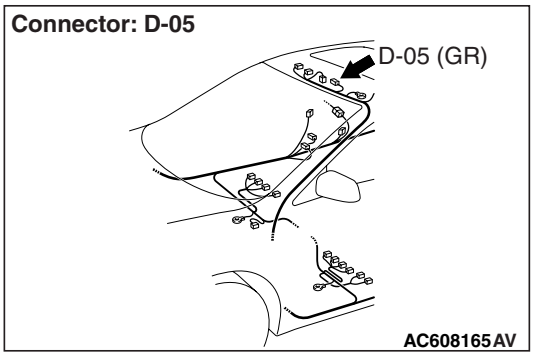


AC608147AG

TSB Revision







TROUBLE JUDGEMENT

The ETACS-ECU will set DTC U1515 when no communication has been carried out for more than a certain period after the slave task received last valid data.

TROUBLESHOOTING HINTS

- The ETACS-ECU may be defective.
- The slave ECU may be defective.
- LIN bus lines shorted to power supply
- LIN bus lines shorted to ground

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the following connectors.

Check the following connectors:

- Column switch connector C-201
- ETACS-ECU connectors C-301 and C-316
- Sunroof motor assembly connector D-05
- Power window main switch connector E-15 <Vehicles with auto down and auto up mechanism>

Q: Are all the connectors in good condition?

YES : Go to Step 2.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 2. Check the following wiring harness.

Check the wiring harness between the following connectors:

- Wiring harness from ETACS-ECU connector C-301 (terminal 1) to column switch connector C-201 (terminal 3)
- Wiring harness from ETACS-ECU connector C-316 (terminal 1) to sunroof motor assembly connector D-05 (terminal 7)
- Wiring harness from ETACS-ECU connector C-301 (terminal 1) to power window main switch connector E-15 (terminal 7) <Vehicles with auto down and auto up mechanism>

NOTE: Also check joint connector C-02 and intermediate connector C-126 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-02 or intermediate connector C-126 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are all the wiring harness wires in good condition?

YES : Go to Step 3.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 3. Measure the voltage at the LIN bus lines.

Check the LIN bus lines for short to power supply.

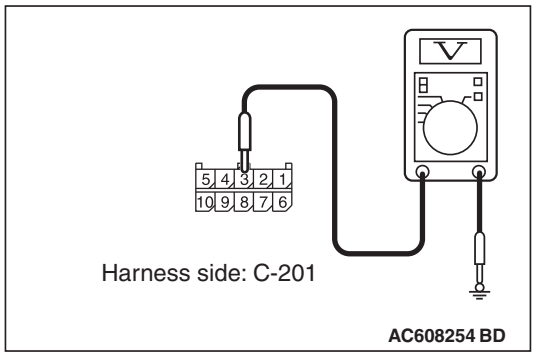
(1) Disconnect all the connectors which are connecter to the LIN bus lines.

(2) Turn the ignition switch from "LOCK" (OFF) to "ON" position .

(3) Measure the voltage between column switch connector C-201 (terminal 3) and ground.

- The voltmeter needle does not swing.

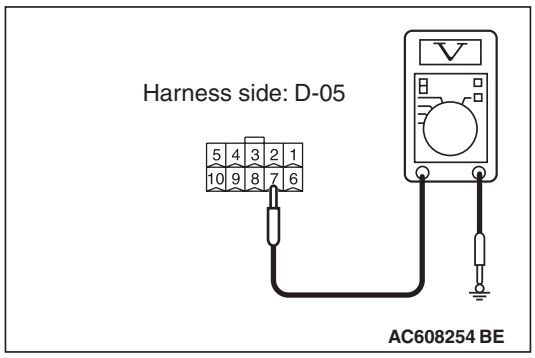
NOTE: If the LIN bus lines are short to power supply, the voltmeter indicates a constant value.



(4) Measure the voltage between sunroof motor assembly connector D-05 (terminal 7) and ground.

- The voltmeter needle does not swing.

NOTE: If the LIN bus lines are short to power supply, the voltmeter indicates a constant value.



Q: Is the check result normal?

YES : Go to Step 4.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

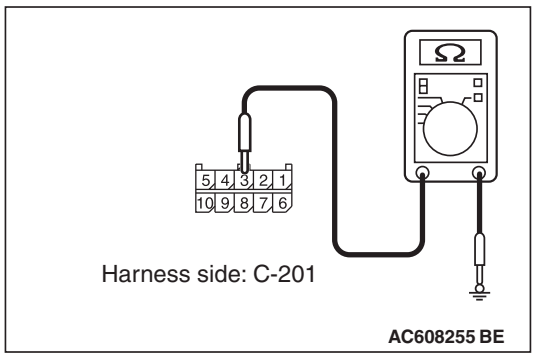
TSB Revision

STEP 4. Measure the resistance at the LIN bus lines.

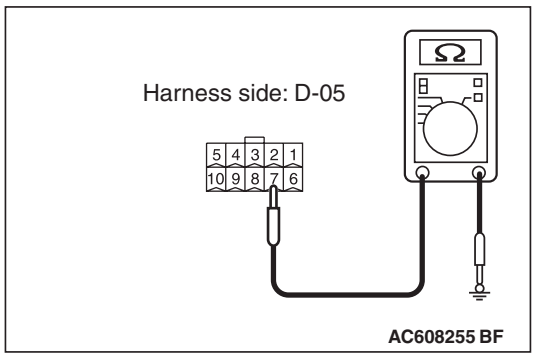
Check the LIN bus lines for short to ground.

(1) Disconnect all the connectors which are connecter to the LIN bus lines.

(2) Measure the resistance value between column switch connector C-201 (terminal 3) and ground.
- No continuity (1 kΩ or more)



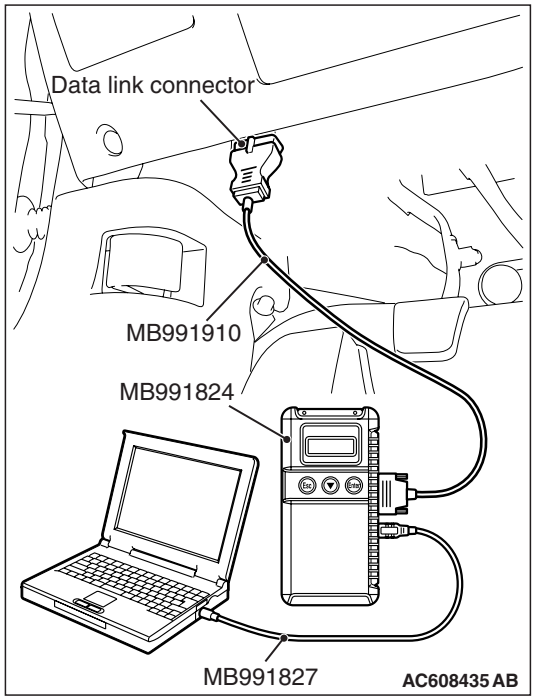
(3) Measure the resistance value between sunroof motor assembly connector D-05 (terminal 7) and ground.
- No continuity (1 kΩ or more)



Q: Is the check result normal?

YES : Go to Step 5.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.



STEP 5. Check the column switch.

Disconnect column switch connector C-201, and recheck whether DTC U1515 is set.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Connect all the relevant ECUs, and disconnect column switch connector C-201 only.
(7) Erase the DTC.
(8) Turn the ignition switch from "LOCK" (OFF) to "ON" position .
(9) Check whether DTC U1515 is set.

NOTE: If DTC U1515 is not set, DTC U1109 is set because the column switch is disconnected. This is normal.

(10) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1515 set?

YES : Reconnect the column switch connector, and go to Step 6.
NO : Replace the column switch.

STEP 6. Check the sunroof motor assembly.

Disconnect sunroof motor assembly connector D-05, and recheck whether DTC U1515 is set.

(1) Connect all the relevant ECUs, and disconnect sunroof motor assembly connector D-05 only.
(2) Erase the DTC.
(3) Turn the ignition switch from "LOCK" (OFF) to "ON" position .
(4) Check whether DTC U1515 is set.

NOTE: If DTC U1515 is not set, DTC U0169 is set because the sunroof motor assembly is disconnected. This is normal.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1515 set?

YES <Vehicles with auto down and auto up mechanism> : Reconnect the sunroof motor assembly connector, and go to Step 7.
YES <Vehicles without auto down and auto up mechanism> : Reconnect the sunroof motor assembly connector, and go to Step 8.
NO <DTC is not set> : Replace the sunroof motor assembly.

TSB Revision

STEP 7. Check the power window main switch.

Disconnect power window main switch connector E-15, and recheck whether DTC U1515 is set.

(1) Connect all the relevant ECUs, and disconnect power window main switch connector E-15 only.
(2) Erase the DTC.
(3) Turn the ignition switch from "LOCK" (OFF) to "ON" position .
(4) Check whether DTC U1515 is set.

NOTE: If DTC U1515 is not set, DTC U0215 is set because the power window main switch is disconnected. This is normal.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1515 set?

YES : Reconnect the power window main switch connector, and go to Step 8.
NO : Replace the power window main switch.

STEP 8. Recheck for diagnostic trouble code.

Check again if the DTC is set to the ETACS-ECU.

(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) to "ON" position .
(3) Check whether DTC U1515 is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the ETACS-ECU.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-13).